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## Coping with Attention Deficit Hyperactivity Disorder: A Manual for Parents and Teachers

Christine H. A. Peterson

*College of William & Mary - School of Education*

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COPING WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER  
A MANUAL FOR PARENTS AND TEACHERS

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A Thesis

Presented to

The Faculty of the School of Education  
The College of William and Mary

In Partial Fulfillment  
Of the Requirements for the Degree of  
Master of Education

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by

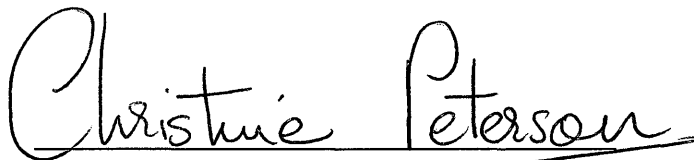
Christine H. A. Peterson

November, 1989

APPROVAL SHEET

This thesis is submitted in partial fulfillment of  
the requirements for the degree of

MASTER OF EDUCATION



~~Christine H. A. Peterson~~

Approved, November 1989



Dr. Ronald Wheeler, Advisor

To my father and mother, whose encouragement and guidance have made  
this possible.

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## ABSTRACT

Attention Deficit Hyperactivity Disorder (ADHD) is the most prevalent childhood disorder, affecting from 3-5% of all school-aged children. The current status of ADHD is discussed in terms of current educational, medical, social, psychological, and psychiatric perspectives, with special emphasis given to test data on the various treatment approaches.

This manual has been compiled as a comprehensive guide for both parents and teachers. It is divided into three chapters and contains the current definition of ADHD given in the 1987 Diagnostic and Statistical Manual of Mental Disorders, III, Revised (DSM-III-R), a critical review of research on the various treatments of the disorder that have gained popularity over the years, and a list of twenty-three suggestions for working and interacting with ADHD children.



**COPING WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER**  
**A MANUAL FOR PARENTS AND TEACHERS**

## I. INTRODUCTION

David, a ten year old, cannot sit still. At school he frequently fails to complete his assignments, is often chastised for running around the classroom, and is constantly in trouble for disrupting his fellow classmates with his incessant chatter. David acts impulsively, often leaving the room without his teacher's permission. His impatience and frequent temper outbursts make it difficult for him to keep his friends. On the Wechsler Intelligence Scale for Children-Revised (WISC-R), he obtained a score of 120, placing him in the above average intelligence category, yet he has trouble with reading and spelling to the extent that he is two years behind grade level.

At home his story is much the same. David constantly fights with his younger brothers, rides his bicycle recklessly, has difficulty catching a ball, and has trouble sitting through a half hour television program. His mother is frustrated and claims that she "cannot go on much longer, the pressure is too much." Because of the limited number of successes and positive experiences he has had in his school and home environment, David has begun to show evidence of a low, negative self-concept.

Children like David -- behaviorally overactive, fidgety, distractable, aggressive, impulsive, and with some difficulties in learning -- may be found in almost every classroom in America. Some of these children evidence problems severe enough to warrant special class placement, but the majority of them remain within the regular education system. As might be expected, teachers find such children difficult to work with, and unless appropriately managed these same children are at risk for later academic and social failure. The condition of these children is today referred to as Attention Deficit Hyperactivity Disorder (ADHD), and, needless to say, these children present a challenge not only to our teachers but also to our educational system as a whole.

Attention Deficit Hyperactivity Disorder (ADHD) has been classified by the Diagnostic and Statistical Manual of Mental Disorders-III-Revised (DSM-III-R, 1978) as a Disruptive Behavior Disorder. It is said to be present in children who display age-inappropriate motor activity, inattention, and impulsivity. It is believed to be prevalent in about 20% of the general population (Scott, 1987) and 3-5% of the school population (Friedman & Doyal, 1987; Virginia Department of Education, 1988; O'Brien & Obrzut, 1986; DSM-III-R, 1987; and others). It has been identified by Colburn (1988), as "the most prevalent childhood disorder, yet the one most frequently misunderstood and therefore misdiagnosed" (p. 17). ADHD is

an umbrella term in the sense that it is used to describe a group of children who have a number of problems in common. Many of these children have one or more learning disabilities which hinder their academic and social development. Many of them are hyperactive and distractible, with short attention spans. Several of them develop emotional, social, and family problems largely because of the failures and frustrations they repeatedly experience in both their home and school environments.

It is important to note that ADHD is not a form of mental retardation. In fact, most of these children are of average or above-average intellectual ability. These children are not primarily emotionally disturbed. However, they tend to develop a wide variety of emotional problems because of the failures and frustrations they face in everyday life. It is important to note that the emotional problems sometimes observed in these children do not cause their academic difficulties; rather, the academic difficulties cause their emotional problems (Silver, 1987; McGee & Share, 1988; Barkley, 1986).

#### Problem Statement

This project was undertaken because of my experiences as a special educator, in which I found that both parents and

teachers who work with ADHD children are unable to obtain a brief yet comprehensive guide on the current status of ADHD from educational, medical, social, psychological, and psychiatric perspectives. In researching material for this project I was surprised to find that most articles and booklets designed specially for parents and teachers do not provide a critical review of the treatments they describe. For example, Attention Deficit Disorders (Silver, 1987) tells teachers: "your observations are important. The child's physician may need these observations to decide on the dosage or frequency of medication" (p. 8). But does not tell the teacher why medication is the number one choice of treatment for these children nor how variations in dosage or frequency may affect the child's behavior. The principal short coming I have found in all such pamphlets is the lack of information from which to compare different approaches to ADHD and test data to evaluate the success of each. I have endeavored to present just such information in this review of the literature, and to help enlighten both parents and educators of the various intervention techniques that may be used with these children in the home and school environments.

#### Importance of Statement

My personal experience has only served to stress the importance of creating a critical manual, as many parents and

teachers continue to use treatment approaches which have long been found to be ineffective and in some cases even detrimental to the child's development and well-being. Because these children are difficult enough for parents and teachers to deal with without the effects of medical and psychological maltreatments, there is an urgent need for a comprehensive, research-based manual on ADHD. It is only through reaching these children in an effective manner that they can be given the opportunity to learn, to grow educationally and emotionally, and to become a productive part of our society.

#### Limitations of Study

Due to restrictions on the size of the project, inadequate time, and limited facilities, all of the over five hundred articles, studies and books on ADHD could not be reviewed. As an educator's thesis, ADHD is here viewed from an educators and an educational point of view rather than, for example, a physician's. This manual is not a substitute for consultation with a qualified physician, counsellor, special educator, or child-care specialist. It does not include information derived from survey instruments or personal interviews.

#### Procedures Used

Data were obtained from the following sources:

A. Libraries

1. College: College of William and Mary (Swem library), Old Dominion University, Hampton University, Medical College of Virginia, and University of Virginia.

2. Personal: My own collection of textbooks, newspaper articles, and journal articles, together with the personal library of Dr. Louis P. Messier, Dr. Lori Korinek, and JoAnn Wagner.

3. Learning Resource Center, College of William and Mary, School of Education, and the Old Dominion University Learning Resource Center.

B. Textbooks

C. Periodicals

D. Professional Journals

E. Virginia Department of Education Task Force Report

F. Newspaper articles

Definition of Terms

Attention Span -- the length of time an individual can concentrate on a specific subject or activity without thinking of or attending to something else.

Behavior Modification -- manipulation of environmental contingencies in order to control or modify the subjects targeted behavior.

Biofeedback Training -- a technique involving the use of electronically amplified signals from the psychophysiological system in an effort to improve conscious control of normal unconscious body functions.

Birth Trauma -- any stress to the foetus during the birth process that may cause damage or impairment.

Cognitive Behavior Modification -- a technique to control and direct one's own behavior. A model which combines manipulation of environmental contingencies with self-control processes of the subject. Includes self-instruction, self-monitoring, and self-reinforcement. A kind of "self-talk" that provides the individual with a verbal routine to follow in completing assignments.

Contingency Contracts -- placing contingencies for reinforcement (if...then...statements) into a written document. A permanent product that both teacher and student can refer to.

Differential Reinforcement of Incompatible Behaviors -- the reinforcing of a response that is topographically incompatible with a behavior targeted for reduction.

DSM-III -- Diagnostic and Statistical Manual, a manual that defines and classifies mental disorders according to American Psychiatric Association guidelines.



Early Intervention -- providing appropriate services as soon as possible to lessen the effects of a handicapping condition or special need that may hinder a child's normal development.

Emotional Disturbance -- seriously emotionally disturbed children exhibit one or more of the following characteristics over a long period of time and to a marked degree:

1. An inability to learn which cannot be explained by intellectual, sensory, or health factors;
  2. An inability to build or maintain satisfactory interpersonal relationships with peers and teachers;
  3. Inappropriate types of behavior or feelings under normal circumstances;
  4. General pervasive mood of unhappiness or depression;
  5. A tendency to develop physical symptoms, pains, or fears associated with personal or school problems
- (20 U.S.C. 1401 [13]).

Hyperactivity -- excessively or abnormally active for a particular chronological or mental age.

Interdisciplinary assessment -- involves specialists from different disciplines all performing separate evaluations and formulating separate treatment recommendations in order to arrive at the most appropriate educational plan

geared towards meeting the wide range of special needs of the exceptional student.

Learning Disability -- a disorder in one or more of the basic psychological processes affecting the understanding or use of spoken or written language, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain disfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, mental retardation, emotional disturbance, or environmental disadvantage.

Low Self-Esteem -- negative beliefs and attitudes that one has about oneself.

Mental Retardation -- the diagnostic criteria for mental retardation according to the DSM-III-R (1987) includes:

- A. Significantly subaverage general intellectual functioning: an IQ of 70 or below on an individually administered IQ test.
- B. Concurrent deficits or impairments in adaptive functioning, i.e., the person's effectiveness in meeting the standards expected for his or her age by his or her cultural group in areas such as social skills and responsibilities, communication, daily

living skills, personal independence, and self-sufficiency.

C. Onset before the age of 18 (pp. 31-32).

Metacognition -- an individual's understanding of his or her own cognitive processes; knowledge of one's own cognitive resources relative to a specific problem.

Multidisciplinary Assessment -- the gathering of information from a wide variety of sources including parents, teachers, peers, pediatrician, counsellor, school nurse, physician, and special educator. Assessment in different settings including school, home, play, clinic, and so on. Looking into the multiple components of the condition; using a variety of assessment procedures for example, interviews, questionnaires, rating scales, and tests.

Polygenic Inheritance -- a genetic model which states that more than one gene is involved in the transmission of a disorder and a proband manifests the disorder only when the correct number or combination of genes are present.

Premature Birth -- delivery of the baby before the end of the full nine-month term.

Punishment -- a consequent stimulus that is contingent upon the occurrence of a behavior and results in the reduction of that behavior.

Response Cost -- a procedure for the reduction of inappropriate behaviors through withdrawal of specific

amounts of reinforcement contingent upon the behavior's occurrence.

Self-Concept -- the perceptions that an individual has of his or her physical, social, and intellectual capabilities.

Self-Management -- the ability to regulate one's own behavior.

Sex-Linkage -- trait determined by a recessive gene located on an X-chromosome.

Simple Autosomal Dominant -- the trait or characteristic of the dominant gene of a gene pair that is expressed.

Simple Autosomal Recessive -- the trait or characteristic of the recessive gene that is expressed only when two similar genes come together.

Social Skills -- learned abilities that enable one to communicate and interact with others in a socially acceptable manner.

Time-Out -- a procedure for the reduction of inappropriate behavior whereby the student is denied access to the opportunity to receive reinforcement for a fixed period of time.

Token System -- a system of behavior modification in which tangible or token reinforcers such as points, plastic chips, metal washers, poker chips, or play money are given as rewards and later exchanged for back-up reinforcers that have value in themselves (food, trinkets, play time, books etc.).

Unidimensional Polythetic Definition -- a technical definition allowing categories of characteristics, yet giving no emphasis to any single characteristic or combination of characteristics.

## II. A REVIEW OF THE LITERATURE ON ATTENTION DEFICIT HYPERACTIVITY DISORDER

The philosophy behind this manual is that parents and teachers must have a comprehensive knowledge of the educational discipline's literature on Attention Deficit Hyperactivity Disorder. It is only when the literature on ADHD has been critically reviewed and studied that parents and teachers are in a position to effectively combat the ignorance of the disorder which has led to decades of maltreatment. This critical review of the literature has been divided into four parts. First, a discussion of the historical background of ADHD explores its most recent redefinitions, its current definition according to the Diagnostic and Statistical Manual of Mental Disorders, Third Edition-Revised, the disorder's associated features, and Undifferentiated Attention Deficit Disorder (UADD). Second, the various causes of ADHD are discussed. Third, the current procedures for identification and assessment are related. This section of the manual concludes with a critical review of the various treatment approaches. In moving from the oldest to the most recent treatment approaches we move toward the approaches preferred after critical testing.

### Historical Background of ADHD

No single term in the entire history of childhood psychopathology has been subject of so many redefinitions, reconceptualizations, and renaming as the disorder currently referred to as "Attention Deficit Hyperactivity Disorder" (ADHD). This disorder has been recognized as a separate entity for at least the last half century, and descriptions of associated behaviors have remained remarkably consistent over the years (Virginia Dept. of Education, 1988; Lahey et. al., 1988).

ADHD as we understand it today was first recognized as a separate category in the late 1930's and early 1940's when behaviorally oriented pediatricians identified these children as "Brain Damaged" or "Brain Injured" who showed behavior patterns which closely resembled those of brain damaged individuals (Virginia Dept. of Education, 1988; Lahey et. al., 1988; Silver, 1987). It soon became apparent, however, that a large number of these children did not have a history of damage or trauma, nor was there any presence of abnormal neurological signs. Yet the problems these children experienced were in some unique way related to an inadequacy with brain functioning.

In order to get away from the term "Brain Damage" and to reflect the idea of difficulty with brain functioning, the label "Minimal Brain Dysfunction" or "Minimal Brain Damage"

was used in the 1950's (Silver, 1987; Virginia Dept. of Education, 1988).

By the 1960's the term "Hyperactivity" became the choice for many professionals as it reflected more accurately the condition of these children described as overactive, inattentive, and impulsive. Among the educational and psychological circles it was held that "diagnosis of the underlying disorder was based on behavioral criteria, not on any documentable medical evidence" (Virginia Dept. of Education, 1988, p. 4).

In the 1970's a large number of professionals in the medical, educational, and psychological fields were of the opinion that difficulties related to attention and concentration were more "cardinal symptoms of the disorder" (p. 4) than those of activity (Virginia Dept. of Education, 1988). It was believed that the child's inability to pay attention in the first place was at the root of the child's social and academic problems (Virginia Dept. of Education, 1988; Silver, 1987; McGee & Share, 1988; Barkley, 1986, and others).

With the publication of the 1980 Diagnostic and Statistical Manual of Mental Disorders, Third Edition, (DSM-III), the first detailed diagnostic definition of the disorder



was made. According to this definition a child was to be considered "Attention Deficit Disorder" (ADD) if he or she manifested deficits in three symptom areas: sustained attention, impulsivity, and motor hyperactivity. This division of the three areas was based on the implicit assumption that the defining characteristics of the syndrome were multifaceted and that only children who manifested all three were to be considered attention deficit. In the DSM-III two basic kinds of ADD were identified: ADD with hyperactivity and ADD without hyperactivity.

The most recent change in terminology has been brought about in the DSM-III-R, (1987), from "Attention Deficit Disorder" (ADD) to "Attention Deficit Hyperactivity Disorder" (ADHD). According to the Virginia Department of Education 1988 Task Force Report, this change reflects a compromise between members of the DSM committee, some of whom believe that ADD can exist without hyperactivity, and others who believe that it cannot.

In the DSM-III-R the list of symptoms has been altered and the distinction between the three dimensions of symptoms seen in the DSM-III have been eliminated. The new category uses a unidimensional polythetic definition which states that a child is considered to manifest ADHD if he or she exhibits eight or more of the listed fourteen symptoms. According to

this definition no single symptom or combination of symptoms are given special significance. That is , the child need not manifest symptoms in all three areas (attention, impulsivity and motor hyperactivity) that defined ADD in DSM-III of 1980.

### Current Definition and Diagnostic Criteria

According to DSM-III-R, the essential features of ADHD are "developmentally inappropriate degrees of inattention, impulsiveness, and hyperactivity" (p. 50). The report recognizes that younger children exhibit higher rates of the symptomatic behavior than do older children. Although the symptomatic behavior of most ADHD individuals is manifested across settings (home, school, work and so on), in some cases it may be restricted to only one or two settings (DSM-III-R, 1987; Whalen, 1987; Virginia Dept. of Education, 1988). It is important to mention here that symptomatic behavior "may be minimal or absent when the person is receiving frequent reinforcement or very strict control, or is in a novel setting or a one-to-one situation (e.g., being examined in the clinician's office, or interacting with a video game)" (DSM-III-R, 1987, p. 50). Data collected over the years points to the fact that in most cases the symptom of hyperactivity tend to diminish with age. However, problems related to inattention and impulsivity tend to persist into adolescence

and adulthood (DSM-III-R, 1987; Virginia Dept. of Education, 1988; Friedman & Doyal, 1987; Barkley, 1986; and others).

According to the DSM-III-R (1987), the diagnostic criteria for ADHD is as follows:

- A. An ongoing disturbance for at least six months during which at least eight of the following fourteen symptomatic behaviors are present:
  - 1. often fidgets with hands or feet or squirms in seat (in adolescents, may be limited to subjective feelings of restlessness).
  - 2. has difficulty remaining seated when required to do so.
  - 3. is easily distracted by extraneous stimuli.
  - 4. has difficulty awaiting turn in games or group situations.
  - 5. often blurts out answers to questions before they have been completed.
  - 6. has difficulty following through on instructions from others (not due to oppositional behavior or failure of comprehension), e.g., fails to finish chores.
  - 7. has difficulty sustaining attention in tasks or play activities.

8. often shifts from one uncompleted activity to another.
9. has difficulty playing quietly.
10. often talks excessively.
11. often interrupts or intrudes on others, e.g., butts into other children's games.
12. often does not seem to listen to what is being said to him or her.
13. often loses things necessary for tasks or activities at school or at home (e.g., toys, pencils, books, assignments).
14. often engages in physically dangerous activities without considering possible consequences (not for the purpose of thrill-seeking), e.g., runs into street without looking.

B. Onset before the age of seven.

C. Does not meet the criteria for a Pervasive Developmental Disorder. This is the only exclusionary clause. (DSM-III-R, 1987, p. 52-53).

A diagnosis of ADHD may further be categorized on the basis of severity of the condition. A diagnosis of "mild" is usually made when the symptoms are few in number (the minimum required to make the diagnosis) and there is minimal or no impairment in school and social functioning. In the case of

a diagnosis of "moderate" the symptoms and functional impairments fall somewhere between mild and severe. A diagnosis of "severe" is given when the symptoms observed are in excess of the minimum number required to make a diagnosis and when functional impairments in both academic and social spheres are significant (DSM-III-R, 1987).

#### Associated Features of ADHD

The associated features of ADHD have been found to vary with age. For instance, hyperactivity which is often associated with younger ADHD children is not as common in adolescents and young adults. Despite this there are some features associated with the disorder that are encountered often enough to make mention of them: low frustration tolerance, aggression, frequent mood swings, general high frequency and high level of vocal noisiness, high rate of risk-taking behavior, learning disabilities most often associated with the processing of auditory information, poor language development, low self-esteem and social immaturity (DSM-III-R, 1987; Barkley, 1986; and others).

#### Undifferentiated Attention Deficit Disorder (UADD)

In using a unidimensional definition for ADHD some confusion has arisen concerning the original DSM-III category

of Attention Deficit Disorder-Without Hyperactivity (ADD/WO). In order to overcome this, a tentative diagnostic category, Undifferentiated Attention Deficit Disorder (UADD), has been added to DSM-III-R in which "the predominant feature is the persistence of developmentally inappropriate and marked inattention that is not symptomatic of another disorder " (DSM-III-R, 1987, p. 52), but which in DSM-III would have been categorized as Attention Deficit Disorder-Without Hyperactivity. Because of its tentative nature, no list of symptoms of inattention has been provided, and a call for further research on the topic has been made by Lahey et. al., (1983).

#### Causes of ADHD

Despite fifty years of research the exact cause or causes of ADHD remain unknown (Texas Dept. of Mental Health, 1982; Colburn, 1988; Friedman & Doyal, 1987; Barkley, 1986; and others). Over the years researchers have put forward several theories related to genetic, biological, social, physiological, psychological, and environmental factors. Yet none of these theories have been able to provide conclusive evidence as to what actually causes children to become attention deficit and hyperactive.

The opinion currently held by most authorities in the field is that ADHD is probably caused by a combination of certain genetic, neurological, biochemical, social, and environmental factors interacting with each other in a highly complex and as yet inexplicable manner to produce the disorder as opposed to, any of the above factors acting independently (Colburn, 1988; Texas Dept. of Mental Health, 1982). Ronald J. Friedman and Guy T. Doyal (1987), are of the opinion that "Children are probably born with Attention Deficit Disorder, although in many cases, when reconstructing with parents the child's early development, it is clear that symptoms may not be present at birth....Whatever the physical basis for the disorder might be, it is most likely that it existed from the beginning of the child's life, and it is only the symptoms that have been delayed in making their appearance" (p. 14).

Other possible causes suggested by different investigators at different times include food additives, radiation leaks from television sets and fluorescent lights, lead poisoning, vitamin deficiencies, and complications of pregnancy, including premature birth, drug and alcohol abuse, birth trauma, and illness or disease (Texas Dept. of Mental Health, 1982).

Behaviorally oriented researchers have been inclined to attribute ADHD to negative social and environmental influences

including poor, stressful parent-child relationships, poor teaching techniques, and so on (Texas Dept. of Mental Health, 1982).

A recent study conducted at Emory University (1988), talks about "masked depression" in relation to ADHD. Ronald T. Brown and his associates conducted a study in which they compared the Children's Depression Inventory (CDI) scores of 116 ADHD children with those of a group of comparable normal children, and found that "depression scores yielded significant differences between ADD and normal children, indicating that ADD children scored in a significantly more depressed range on the CDI than did their normal counterparts"(p. 124). Although these findings seem to support the concept of "masked depression" originally posited by L. Cytryn and D. McKnew in 1974, Ronald T. Brown and his associates point to the fact that "despite a statistically significant difference between sample means, the scores of the two groups overlap. A considerable number of ADD children apparently did not report themselves as exhibiting symptoms of demoralization or depression, whereas several normal children did report such symptoms, despite the fact that they did not exhibit cognitive or behavioral difficulties" (p.124). These findings of Ronald T. Brown and his associates do not support the concept of a masked depression.



Dennis P. Cantwell, in his article "Genetics of Hyperactivity" (1975), examines several studies conducted between 1971 and 1973 which map the familial pattern of ADHD. According to him possible genetic mechanisms of transmission include "a chromosome anomaly, simple autosomal dominant and simple autosomal recessive transmission, sex-linkage and polygenic inheritance" (p. 262). Given what we currently know about gene dominant and recessive characteristics and the laws of inheritance coupled with our knowledge of ADHD, I am fully in agreement with Cantwell when he says that of all the theories listed above, the most plausible one is that of polygenic inheritance, though it is difficult to prove.

Based on our current knowledge regarding etiology there is no cure for ADHD. In other words, children diagnosed as ADHD do not outgrow their primary problems associated with the disorder once they reach adolescence or early adulthood. Behaviors symptomatic of the disorder persist throughout the child's life, often manifesting themselves in a variety of ways as the child gets older (Colburn, 1988; Coleman & Levine, 1988; Friedman & Doyal, 1987; Barkley, 1986; and others).

#### Identification and Assessment of ADHD

According to William Carey (1988), "the diagnosis of attention deficits in children is probably the most confused

area shared by medicine, psychology, and education today" (p. 348). The actual diagnostic label "ADHD" is given in most cases by a pediatrician, child psychiatrist, neurologist or clinical psychologist (Virginia Dept. of Education, 1988). Parents sometimes become concerned with their child's behavior and initiate an evaluation on their own. In most cases, however, the child's teacher is the one who expresses concern about the child's behavior and recommends that the parents have the child formally evaluated (Virginia Dept. of Education, 1988; Colburn, 1988; Brown, 1985).

Because of the nature of ADHD little consistency remains among professionals in the way in which an assessment is conducted. Listed below are some suggestions drawn from current research which should be followed to arrive at the "best" diagnostic decisions.

Friedman and Doyal (1987) and Brown (1985) discuss the importance of accurately reconstructing the child's past history to understand the child's early temperament pattern. Temperament includes the child's activity level, rhythmicity, approach or withdrawal, adaptability, intensity, threshold of responsiveness, quality of mood, distractibility, attention span and persistence.

Others such as Whalen (1987), Barkley (1986), the Canadian Paediatric Society (1988) and the Virginia Dept. of Education Task Force Report (1988) discuss the importance of an extensive and comprehensive multidisciplinary investigation aimed at:

1. Obtaining information about the child from multiple sources such as parents, teachers, siblings, peers, and any other significant individuals in the child's environment.
2. Obtaining information about the child's functioning in a variety of settings -- home, school, social, group and so on.
3. Assessing all three dimensions of ADHD (i.e., impulsivity, inattention and hyperactivity).
4. Obtaining multiple types of data such as that obtained through interviews, observation, questionnaires, rating scales, psychoeducational tests, physical tests, psychological, and psychiatric tests.
5. Obtaining information about the medical, social, and environmental background of the family.
6. Obtaining information about the child's current physical and neurological condition as well as, information regarding the child's developmental profile done by a qualified health care professional.

Once the child has been diagnosed ADHD, the next step ideally involves an interdisciplinary conference involving the child's teacher, parents, school principal, school psychologist, and school special educator to discuss a management program geared at meeting the child's special needs. It is interesting to note that ADHD as a separate special education category is currently not recognized in the state of Virginia. A child identified as ADHD who does not meet the criteria for placement in either a learning disabled, emotionally disturbed or mentally handicapped program will not be able to avail of special education facilities. Although a number of these children do evidence learning disabilities and emotional problems severe enough to warrant special class placement a large majority of them remain within the regular education system without treatment of any kind. We as educators are turning a deaf ear to all the research that talks about the unparalleled advantages of early intervention: monitory benefits, social benefits, and individual benefits. Smith and Strain, (1984) list three primary reasons for intervening early: "to enhance the child's development, to provide support and assistance to the family, and to maximize the child's and family's benefit to society" (p. 1). Current Virginia law on the status of ADHD encourages the child's problems to become severe and multiple before acknowledging them instead of attending to and treating them as soon as they are identified.

## Treatment Approaches to ADHD

As might be expected, researchers over the last eighty years have put forward a wide variety of treatments aimed not only at explaining the underlying causes of the disorder but also at providing some relief from the symptoms and disruptive behavior patterns of hyperactive children. Some of the approaches discussed below have stood up well under clinical testing and have indeed proved themselves, while others have not. I have included with each treatment a discussion of its features and merits along with some of the scrutiny and clinical testing it has undergone.

### 1. Diet

Over the years, researchers assuming some organic cause at the basis of ADHD, have suggested that a variety of dietary factors contribute to hyperactivity and the behaviors characteristic of this disorder. One commonly encountered notion is that blood sugar level is closely related to overactivity, and that if behavior is to improve, all refined sugar must be eliminated from the child's diet. Others, according to Barkley (1986), "have suggested that hyperactive children consume large amounts of sugar, which leads to hypoglycemia, irritable moods, and restless behavior" (p. 412). In a study to determine the relationship of sugar

consumption to the behavior of hyperactive and normal children, Prinz, Roberts, and Hantman (1980) found that on seven measures of dietary intake there were no significant differences between the two groups in terms of consumption of sugar products or the ratio of sugar products to other nutritional foods. However, the normal children were found to consume significantly more food in general than the hyperactive children. Correlations of the children's behavior in various playroom settings revealed that hyperactive children did tend to consume larger quantities of sugar, and that this resulted in increased restless and aggressive behavior, but not in greater locomotive behavior. For the group of normal children it was found that greater sugar consumption led to increased locomotion but not to increased restless and aggressive behavior. Although the findings of this study support the notion that high blood sugar levels in ADHD children increase restless and aggressive behavior, the causal direction of this relationship remains unclear. Further research in this particular area aimed at pinpointing more accurately the causal relationship between blood sugar level and increased restless and aggressive behavior in these children is certainly called for.

The most famous dietary plan for the treatment of ADHD was the Kaiser Permanente diet proposed by Dr. Benjamin Feingold in 1975. Dr. Feingold simply attributed

hyperactivity to an intolerance to food additives and salicylates in about 40%-50% of all diagnosed ADHD children. He believed that some children have a natural toxic reaction to artificial colors, flavorings, antioxidants, preservatives, and so on. He proposed a diet in which all these substances were to be completely eliminated.

In 1976 C. Keith Connors and his colleagues set up a double-blind, crossover treatment program to test Feingold's proposal. Fifteen diagnosed hyperactive children were randomly assigned to one of two treatments (a control diet or an experimental diet that eliminated artificial flavors, colors, and salicylates) for a period of four weeks and then crossed over to the other treatment for an additional four weeks. During both phases of the program teachers and parents rated children on the Connors scales. Although both the teachers' and parents' ratings reported fewer hyperkinetic behaviors while the children were on the experimental diet, only the teachers ratings were statistically significant. The reduction of symptomatic behaviors noted by both parents and teachers was approximately 15% from the original baseline ratings.

Although these results appear significant, a closer examination of the study reveals that there were a number of flaws which could have resulted in bias and therefore

scientifically invalid results. For instance, the two diets were not adequately matched. By looking at the foods that comprised each it would have been simple to distinguish which treatment phase a particular child was in. This could have resulted in experimenter bias on the part of the parents or teachers who were rating the children's behavior, thereby invalidating the results. Second, the small size of the sample raises questions about its representativeness of the general ADHD population (approximately 20% of the general population and 2-3% of the school population). If the sample used in the study was not representative of the population it was representing then results whether statistically significant or not cannot be generalized. Third, the results obtained were not significant in statistical terms. Finally, the ratings of the childrens' behaviors were purely subjective. Good experimental practice calls for objectivity.

In 1980 C. Keith Connors and his colleagues conducted another study in which 16 hyperactive children who had responded favorably to the Feingold diet were challenged (while on the diet), with foodstuffs containing large quantities of artificial dyes. In order to meet the standard requirements of scientifically acceptable experimentation, the researchers made use of placebos which were exactly like the experimental variables except that they contained no artificial dyes. This study indicated no statistically



significant effects of the artificial dyes on the behavior of these children, either as measured by parent or teacher rating scales, or as noted by a visual-motor tracking task believed to measure distractibility.

On closer examination of the results by Connors and his colleagues, it was found that three of the children might have shown a deterioration in behavior in response to the artificial food dyes. Interestingly, these children were the youngest in the group and tended to show behavior changes on measures of attention span and distractibility. To further examine these findings Connors and his colleagues conducted a second phase of the study. In this phase they tested a group of young ADHD children in the same manner as the first group. It was observed that artificial food dyes did significantly effect the behavior of younger ADHD children as noted by parents.

Barkley (1986) in reviewing the above studies notes that: A major problem with this series of challenge studies and with many to be discussed subsequently lies in their application of a single-dose administration of food dyes to children as part of the experimental procedures. The doses that are used in these and in subsequent studies are considered equal to if not greater than the average daily amount of food additives that children are likely

to consume, as estimated by various Federal or commercial agencies. The major difficulty here is that the amount of dye a child may consume during a given day is spread out over the course of the child's waking day --not consumed in a single acute dose. The challenge studies, however, are giving the children this amount of dye, or in some cases more, in a single dose. Hence, the challenge studies cannot be taken as representative of the reactions a typical child would show to food dyes if small amounts of the dye were consumed over a long period of time (p. 403-404).

Another study that supports Feingold's theory was conducted by Terry Rose in 1978 on two eight-year-old, hyperactive girls who had been found to respond positively to the diet. Rose placed both girls on the diet and preceded to challenge them periodically with cookies that contained food dyes or cookies that did not. Objective measures of the girls classroom behaviors were recorded throughout the study. Rose found that the girls on-task and out-of-seat behaviors were indeed negatively effected by the food dyes. These results and those obtained by Connors and his colleagues in their 1980 study indicate that a small group of hyperactive children may indeed be effected by the ingestion of artificial food dyes. It would be interesting however, to determine whether Barkley's point of concern with these studies in their

application of a single-dose administration often much larger than what would normally be consumed by the children in a single day, is indeed significant.

There have been a number of rigorously conducted studies in recent years that have found no positive effects of the Feingold diet on hyperactive behavior, however. The earliest was a 1978 study conducted by J. Preston Harley and his colleagues. This two-phase, cross-over study was conducted on 36 hyperactive boys randomly assigned to one of two groups. Group one first received the experimental diet for a period of time and then switched to the control diet for the same amount of time. Group two first received the control diet and then the experimental diet. All boys were rated by their parents and teachers throughout the study in addition to being measured on objective classroom and laboratory scales of attention span and concentration. It is interesting to note that only the parent ratings showed any positive changes in behavior as a result of the experimental diet, and that these improvements were noted only among the preschool hyperactive boys. These findings are similar to those of Connors and Rose. Examination of the results by Harley and his colleagues on the laboratory measures of classroom behavior, attention, and neuropsychological measures showed no significant changes as a result of the diet.

The next phase of the study tested nine hyperactive boys who had responded favorably to the Feingold diet. They were matched on the basis of grade placement and academic ability, with nine normal boys. All 18 boys were placed on the Feingold diet for 11 weeks. They were periodically challenged with either placebos or food stuffs containing artificial dyes. Measures of behavior for both groups of boys included parent and teacher ratings, classroom observations, and neurological test scores. The results did not show any adverse effects of the artificial food dyes on the behavior of either the normal or the hyperactive boys.

In 1980 a similar study was conducted by Bernard Weiss in which 22 children were maintained on the Feingold diet and periodically challenged with foods containing artificial colors. Double-blind procedures were used and behaviors observed were recorded by parents and teachers. The results of this study indicated that only 2 of the 22 children responded in a negative manner to the food dyes. In the case of the remaining 20 children, no changes were observed.

J. Ivan Williams and his colleagues conducted another comparison study of the effects of stimulant medication and the Feingold diet on the behavior of hyperactive children in 1978. Williams identified 26 hyperactive children who participated in this study. Throughout the course of the

study behavior checklists were completed by parents and teachers to record changes in the childrens' behaviors. The results of this study indicated that stimulant medication was far more effective in controlling the behavior of these children than the Feingold diet which yielded only inconclusive results. This study in particular lends support to the use of stimulant medication in the treatment of ADHD as opposed to any dietary regime.

The 1978 study conducted by F. Levy on 22 hyperactive children tested before and after four weeks on the Feingold diet revealed that only parent ratings on the Connors scale were significantly affected by the diet. Other objective measures including attention span, perceptual motor ability, and selected subtests of the WISC, did not show any statistically significant effects. Like many other researchers, Levy found that subjective ratings of parents reflected improvements in behavior of hyperactive children placed on the Feingold diet. Although no one has sought to determine why these discrepancies consistently occur, it may be hypothesized that parental ratings are affected by a phenomenon similar to experimenter bias. On the other hand, existing objective measures may not be sensitive enough to pick up these fine degrees of change noted by parents.

Based on the shortcomings of some of the aforementioned studies and the results of others, adopting the Feingold diet as the primary form of treatment for hyperactive children would be unwise. Research indicates that other forms of treatment such as medication and behavior therapy are far more effective in controlling the disruptive behavior patterns often associated with ADHD. The diet should not, however, be ruled out completely. Especially in the case of younger hyperactive children research studies indicate that the diet does have some positive effects. Other factors to be taken into consideration before implementing the diet would be the long-term effects of such a diet on both the psychological and physical well-being of the child. Barkley (1986), addresses these research issues:

First, future studies of a highly rigorous and scientific nature are going to have to find a more dramatic change in behavior as a result of the Feingold diet. Second, future studies must address the issue of whether treatment by the Feingold diet produces any adverse effects on children's nutrition and health. Many investigators have now recognized that the foods that Feingold suggests should be eliminated from children's diets are often high in Vitamin C and carbohydrates. Placing children on the Feingold diet may result in less than desirable levels of Vitamin C and carbohydrate intake for them. Third, the proponents of Feingold's

theories have yet to give any adequate explanation for the mechanism of the effects of food additives on behavior. Fourth, the proponents of the Feingold diet will have to propose their hypotheses with greater specificity, so that tests can be run to determine which of the 200 or more food additives in existence are in fact being proposed as the causes of difficult behavior in children....A fifth issue is that of whether or not families can be expected to make children adhere rigorously to a diet that eliminates such a wide variety of substances normally found in children's nutritional intake (p. 410).

## 2. Vitamin Deficiencies

Lendon Smith (1976) has proposed that the hyperactive behaviors observed in certain children may be treated and controlled to some extent by a number of vitamins and food substances. His theory implies that hyperactive children suffer from some vitamin deficiency or imbalance which results in increased activity, restlessness, shortened attention span and so on. His regime involves the elimination of certain food substances from the child's diet accompanied by an increased intake of certain other food substances and vitamins. Unfortunately, Smith has failed to put forward a well-defined etiology of hyperactivity based on his theories.

He merely proposes that a variety of food substances cause hyperactivity in children and that an equally varied number of vitamins and food substances can be used to treat the frequently encountered behavior problems. A number of his ideas have little or no scientific evidence to support them.

Ronald Trites and his colleagues (1980) conducted a series of studies on hyperactive children and found that these children do indeed have a greater number of allergies to food substances than do matched groups of normal children, and that mild degrees of improvement in their behavior could be attained by eliminating these substances from their diet. The results of Trites studies did not however, result in a complete or statistically significant improvement in the childrens' hyperactivity symptoms.

### 3. Treatment of Allergies

Doris J. Rapp (1986) and John Taylor (1980) have proposed in their books that allergic reactions to substances in a child's environment (pollen, grass, mold, household cleaning materials, paints, and varnishes) are the primary cause of hyperkinetic behaviors in children. Both authors list over fifty sources of possible irritants: "an ingredient in a candy bar or exposure to some seemingly innocuous odor such as the smell of molds, freshly-made popcorn, or



chemically-treated paper"(Rapp, p.8). The authors suggest that eliminating these substances from the child's environment or treating the child medically for allergies does in fact reduce aggressive, impulsive, and hyperactive behaviors. Doris Rapp (1986) cites several cases to substantiate her hypothesis. In a test with wheat allergy extract conducted on a five-and-a-half-year-old boy, Rapp observed changes in drawing and handwriting before testing, after a placebo skin test, and after a wheat allergy test:

The implications of these documented changes in Robert are serious and extremely significant. Children who have this type of sensitivity at a young age could be placed inappropriately in a class for retarded or learning disabled children. The results of I.Q. or psychological testing could vary greatly depending upon what some children eat or smell prior to or during such evaluations. Everyone must be alert to detect why some children appear to learn and act much better at certain times. The answers may be surprisingly simple as soon as the teacher or parent looks for cause and effect relationships (pp. 12-13).

Although Ronald Trites and his colleagues (1980), have provided some evidence that hyperactive children show more allergies to food substances than normal children, there is no evidence to support the notion that these allergies are the

primary cause of childrens' hyperactive behaviors. Further the cases cited by both authors are in every instance single, isolated cases. No where do they cite the results of a study conducted across a group of identified ADHD children, representative of the existing ADHD population, in which a statistically significant percentage of the children were found to have an allergic reaction to one or more of the identified irritants and to improve with treatment. What Rapp and Taylor propose, elimination of the irritant from the child's environment or treating the child medically for allergies, is not monetarily or physically feasible. For example, an identified hyperactive child may be allergic to the nylon fibers in his school carpeting. Would this require the carpeting in the entire school to be replaced? In Rapp's own words, "the results of I.Q. or psychological testing could vary greatly depending upon what some children eat or smell prior to or during such evaluations," so it is virtually impossible to isolate the cause of any particular reaction experienced in the classroom, and equally impossible to remove all of the possible irritants from the child's environment.

#### 4. Fluorescent Lighting

John Ott proposed in 1974 that soft X-rays and radio frequencies emitted from fluorescent lighting and television sets were the primary cause of hyperactive behaviors observed

in children who had been exposed to them (Barkley, 1986). K. Daniel O'Leary and his associates conducted a double-blind study four years later to confirm Ott's results. In this study, seven first-grade children identified as having conduct problems and hyperactivity were tested in a laboratory school classroom for a period of eight weeks. During this time, the lighting conditions in the classroom were alternated at the end of each week from standard cool-white fluorescent lighting to daylight-simulated fluorescent lighting. Observers unaware of the change in lighting conditions recorded the extent of on-task or off-task behavior in the children and completed activity rating scales on each child. At the end of the eight week testing period O'Leary and his associates found no differences between the effects of the two lighting conditions (standard cool-white fluorescent lighting and daylight simulated fluorescent system with controls for the emission of soft-X rays and radio frequencies) on measures of disruptive behavior.

##### 5. Progressive Relaxation and Biofeedback Training

Barkley (1986) reports "a few researchers in recent years have attempted to train hyperactive children in the use of progressive deep muscle relaxation procedures in order to reduce the hyperactive behaviors of these children" (p. 415). Resulting studies, according to Barkley (1986), "have

generally indicated that, although hyperactive children can be successfully trained to relax various muscle groups, there is no evidence of any simultaneous reduction in hyperactive behaviors outside the laboratory setting in which the relaxation training has occurred" (p. 415). It would thus appear that such training has not been highly successful as a treatment program for hyperactive children.

Others reports Barkley (1986), "have attempted to train hyperactive children to alter various parameters of psychophysiological responding through the use of electronically amplified feedback from the psychophysiological system" (p. 415). This biofeedback training like progressive relaxation mentioned above has not been able to bring about changes in behavior in either the laboratory or natural setting, and is not looked upon as a favorable treatment approach for ADHD.

## 6. Pharmacotherapy or Medication

Despite the fact that drug therapy has remained an issue of intense controversy over the last decade, medication, usually in the form of stimulants, continues to be the most popular choice for managing ADHD behaviors in the United States (O'Brien & Obrzut, 1986; Barkley, 1986; and others).

The first reported use of stimulants with behavior problem children is credited to Charles Bradley (1937) who used amphetamine (Benzedrine) and noted marked improvements in behavior and school performance of a group of behaviorally disordered children on a resident in-patient ward. Despite Bradley's encouraging results, stimulants were not the popular choice of treatment for ADHD children until the late 1950's and early 1960's, when the work of researchers such as Eisenberg, Denhoff, Solomons, and Connors came to the forefront. With the passage of time and the lack of knowledge regarding long-term consequences of drug treatment, pharmacotherapy gained popularity to the extent that by 1970 over 150,000 children were being treated in this manner (Barkley, 1986).

Stimulants are distinguished by their ability to increase alertness, arousing the Central Nervous System (CNS) in a manner that accounts for greater attention, lessened motor activity, greater compliance, greater problem-solving ability, and greater consistency. Although the exact nature of the neurological mechanisms involved in producing these effects remains a mystery, it is generally believed that the majority of ADHD children suffer from a neurochemical imbalance which adversely affects neurotransmitters responsible for carrying impulses in the brain (Virginia Dept. of Education, 1988; Friedman & Doyal, 1987; Barkley, 1986; and others). Stimulant

drugs are believed to either increase the amount or the efficiency of neurotransmitters, thereby enabling them to work effectively.

Over the years a number of studies have been conducted to examine the short and long-term effects of stimulant drug therapies on children with diagnosed ADHD. Below the findings of selected studies are briefly discussed in order to determine the credibility of pharmacotherapy as a form of treatment for ADHD.

a. Physiological Effects.

Although over 500 studies have been conducted on the various effects of stimulant medication on ADHD, those that deal specifically with the physiological or metabolic effects of drug therapy are few and far between. Existing research, according to Barkley (1986), "suggests that amphetamines may decrease growth hormone, at least temporarily, while methylphenidate may increase growth hormone. Amphetamines may also increase the amount of free fatty acid in plasma" (p. 193). Barkley (1986) also talks about the effects of stimulants on heart rate and blood pressure "Heart rate, as well as systolic and diastolic blood pressure, may be increased by the stimulants" (p.196).

b. Cognitive and Scholastic Effects.

Studies examining the effects of stimulants on the cognitive measures of attention, memory, vigilance, and intelligence have found that medication positively effects attention span, concentration, impulsivity, and short-term memory. However, stimulants do not appear to have any significant effects on the more complex skills involved in learning, problem solving, and reasoning (Barkley, 1986; O'Brien & Obrzut, 1986).

In terms of scholastic effects, Barkley and Cunningham in 1978 (Barkley, 1986) investigated the findings of 17 studies and concluded that "drugs have almost no effect on scholastic achievement" (p. 197). It is however, important to keep in mind numerous factors such as, each child's individual reactions to drugs, testing which may take place after the optimum effect of the drug has worn off, insensitivity of measures of achievement to actual learning that may be taking place, childrens' learning disabilities, failure of some children to adhere to their medication schedules, and a host of other factors that may actually effect the results of such studies.

c. Behavioral Effects.

Studies dealing with the effects of stimulant drugs on hyperactive children have found that positive effects include improvements in attention span, increased ability to remain on task, and reduction of restless motor activity (Barkley, 1986). Taylor (1979) notes that more than 30 controlled studies of the behavioral effects of stimulants on ADHD children have been reviewed with the same conclusion that "some symptoms found in the hyperactive are diminished in the short term by stimulant drug treatment" (p. 952). These findings are consistent with those of Barkley.

In 1980 Barkley and Cunningham conducted a study on the effects of stimulant drugs on parent-child interactions and found that by increasing responsiveness and improving compliance to commands, stimulants did actually play an important role in improving parent-child interactions. Based on these findings other similar studies reports Barkley were conducted on "teacher child interactions" (p. 197), and results of these studies "bear out our original findings that the stimulant drugs improve compliance to commands to hyperactive children and increase their responsiveness to the interactions of others" (p. 197). These findings are important from an educational point of view as improved compliance and increased responsiveness on the part of the ADHD child would account not only for a more positive learning environment but also for improved peer relations.



#### d. Side Effects of Stimulant Medication.

In 1977 Barkley conducted a review of 27 studies that reported the side effects of stimulant medication on identified ADHD children. He found that the most common side effects were insomnia and loss of appetite. Irritability (mood swings, feelings of sadness, and proneness to crying) and loss of body weight were the next most frequently observed side effects. Headaches and abdominal pain, although reported, were less frequent. Laufer and Shetty (1980) report the side effects commonly associated with the use of Benzedrine, "a pale, pinched, serious facial expression with dark hollows under the eyes; anorexia; transient insomnia; headache; and dryness of the mouth" (p. 2545). Cole (1975) discusses the side effects of Ritalin, the medication most often prescribed, loss of appetite, tension, insomnia, and tachycardia. One side effect that has been noticed only in recent years is the increase of nervous tics. Barkley argues that some hyperactive children may be prone to develop Tourette Syndrome in response to methylphenidate (Barkley, 1986), and urges that "unless these effects are further clarified, hyperactive children who have a prior history of nervous tics or who are rated as highly anxious by parents or teachers should not be treated with any stimulant drug. When drugs are used with hyperactive children without these risk

factors and tics develop, the medication should be discontinued immediately" (p. 210-211).

Despite the findings discussed above, it is important to remember that each stimulant drug has its own unique side effects and that these effects may vary from individual to individual and from dosage to dosage. For instance, Barkley (1986) reports that one side effect about which there are inconsistent results "is that of reduced social interactions with others" (p. 211). In his own research and clinical experience he states "this phenomenon tends to occur at doses of 0.5 mg/kg or higher" (p. 211). The long-term effects of stimulant medication, in the opinion of professionals such as Barkley (1986), remains an area of much needed research. One of the fears commonly voiced by parents is that their child will develop drug dependence and later drug abuse. But there are in fact no reported cases of addiction or serious dependence. Other frequently voiced concerns which are in my opinion substantiated based on existing research, include the effect of stimulants on height and weight, and on the cardiovascular system (Barkley, 1986).

Although medication is the number one choice of treatment for ADHD in the United States (O'Brien & Obrzut, 1986; Barkley, 1986; and others), not all hyperactive children respond favorably to it. Only 60% to 80% do so (Barkley,

1986; Shaywitz & Shaywitz, 1987; and others). Barkley (1986) has estimated "that 1% to 3% of hyperactive children cannot tolerate any dose of stimulant medication" (p. 211).

A study conducted on 61 hyperactive children by Rachel Gittelman-Klein and her colleagues, reported by Whalen and Henker (1980), in which she assigned children randomly to one of three possible treatments: Ritalin alone, behavior therapy with a placebo, and behavior therapy in combination with Ritalin found that: (1) Behavior therapy alone was not as effective as stimulant medication alone, and (2) on all measures, the combined program of stimulant medication and behavior therapy produced the best results. Although drugs are highly effective in controlling some of the symptoms and disruptive behaviors of ADHD, a major drawback of this approach is that drugs teach nothing. They merely alter the likelihood of occurrence of behaviors non-conducive to learning.

## 7. Behavior Modification

Over the last two decades behavior modification has become a popular alternative to pharmacotherapy. Typically, interventions focus on directly observed behaviors, with the goal being a short treatment period. Barkley (1986),

discusses the effects of behavior modification as a form of treatment for ADHD. According to him:

The first step involves identifying the target behavior that will be the focus of the intervention methods. This means that the behavior in question must be specifically defined so that it can be observed and recorded on a reliable basis. Second, the behavior selected should be observed and recorded for a sufficient period of time to permit an analysis of the antecedent and consequent events surrounding its occurrence. These records are then studied to help determine the changes that should be made in a child's environment to bring about improvements in the target behavior.... Throughout this process, the therapist must also determine the appropriate alternative behavior that the child should show in the classroom in place of the inappropriate behavior selected as the target. The next step of the approach involves implementing the suggested changes in the environment and evaluating their effectiveness at changing the target behavior (pp. 369-370).

Some of the behavior modification procedures often implemented in classroom settings according to Barkley (1986) include, positive reinforcement in the form of "adult attention and praise" (p. 370), "high rate or intrinsically rewarding activities (often called privileges) when

hyperactive children display appropriate classroom behavior. These activities may include access to games in the classroom, availability of free play or recess time, permission to assist teachers in performing what to the teacher may be menial classroom activities, or other such typically rewarding activities for children" (pp. 371-372). Secondary reinforcers for appropriate behavior or task completion such as token or point systems may also be employed. These are then periodically exchanged for tangible rewards or activities that the child enjoys (Barkley, 1986).

Theodore Ayllon, Dale Layman, and Henry Kandel (1975), conducted a study in which they demonstrated the effectiveness of employing a token system to modify classroom behavior and academic achievement. In the study three hyperactive children who were receiving medication were observed during both their math and reading classes, and the occurrence of three different classes of phenomena were recorded -- percentage of math problems assigned correctly completed, percentage of reading problems assigned correctly completed, and the occurrence of deviant classroom behavior. All three children were observed while on medication for a seventeen-day baseline. The children were then removed from medication for varying lengths of time, with no behavior modification program being implemented. Once required data was collected the children were placed on a token system in which the children

were reinforced by their teacher for each correct academic response occurring in Math and English. The points the children earned could later be exchanged for activities or tangible rewards such as candy, school supplies, free time and so on. The results obtained in this study indicated that medication was in fact reducing the occurrence of deviant classroom behavior in all three children. However, academic performance in terms of percentage of correct responses remained very low. With the introduction of the token program, academic performance improved significantly, with the percentage of occurrence of deviant classroom behavior showing a further decline.

Other positive reinforcement methods reports Barkley (1986), include "tangible rewards or edible substances as rewards for appropriate behavior" (p. 375), and "contingency contracts" (p. 376).

Punishment methods have also been used widely to control classroom behaviors. According to Barkley (1986), "methods of punishment employing the withdrawal of positive activities from children upon the incidence of inappropriate behavior are those with the greatest applicability to the classroom setting" (p. 376). Some of the most popular methods of punishment according to him include, withdrawal of social attention and praise, or ignoring, whenever the child engages

in behaviors that are inappropriate. Differential reinforcement of other behaviors which involves rewards for positive, acceptable behaviors incompatible with observed negative behaviors. Time out from reinforcement, or social isolation which involves removing the child for a short period of time from the classroom, group, or activity. Response cost which involves some previously agreed upon consequence for occurrence of targeted behaviors, and social reprimands (pp. 376-378).

In a 1982 study on a six-year-old, hyperactive boy, Ross and Ross report the successful use of differential reinforcement and modeling to control impulsivity in both the home and school environments. Brown's 1986 article, "Attention Deficit Disorder" summarizes the research on the efficiency of behavior modification as a treatment approach for ADHD by stating that "some studies have also shown that behavior therapy in conjunction with pharmacotherapy was better than either alone in mild to moderate cases, but that in more severe cases, the pharmacotherapy was the more necessary contributor to the successful results" (p. 45). Brown's summary of the research is in accordance with the findings of Gittelman-Klein and her colleagues (1980), which state that, (1) behavior therapy alone is not as effective as stimulant medication alone, and (2) a combined program of

stimulant medication and behavior therapy produces the best results.

Behavior therapists have in recent years begun talking about making a shift from total reliance on outside control to a model which combines the manipulation of environmental contingencies with self-control processes of the subject. This model, referred to as Cognitive Behavior Modification (CBM), involves self-instruction, self-monitoring, and self-reinforcement, with the child taking an active part in his or her own learning. The purpose in doing this is to bring about a shift in the locus of control from an external to a more desirable internal one, and to further enable generalization across settings (O'Brien & Obrzut, 1986). Research in this area has not been able to provide any conclusive evidence regarding the positive effects of CBM as a treatment approach for ADHD.

All of the preceding treatments of ADHD are significantly weakened by the lack of statistically significant test results coupled with the use of insufficiently objective testing methods or measures. There is, however, some possibility that some relief may be brought about by pharmacotherapy or medication, behavior modification, diet, treatment of vitamin deficiencies, allergies and so on.



The principal short-coming in all of these approaches is that they make no attempt to remove the child's problem behavior. They are not parents' or teachers' approaches but doctors' and pharmacists'. They teach nothing.

Current research indicates that a combination of medication, behavior modification, and educational interventions are the best possible treatment approach for ADHD. There is no more helpful alternative than to regard ADHD as a developmental disorder for which there is no cure, but for which some relief may be brought about by the proper use of a combined treatment approach.

### III. CONCLUSIONS AND RECOMMENDATIONS

Having reviewed the literature and treatment approaches to Attention Deficit Hyperactivity Disorder, I will close this manual with a summary of my research findings, recommendations, and conclusions.

#### Summary of Research Findings

Attention Deficit Hyperactivity Disorder (ADHD), is the term currently used by the DSM-III-R (1987) to refer to a group of children often described by lay persons as distractable, unable to pay attention, lazy, stubborn, immature, talkative, defiant, aggressive, and confrontational. ADHD is the new name for children previously diagnosed as "brain damaged," "brain injured," "minimal brain dysfunction," "hyperactive," and "Attention Deficit Disordered" (ADD). It is important to remember that children identified as ADHD are not brain damaged. In fact, most of these children have average or above average intelligence. It is also important to remember that not all children suffering from ADHD are hyperactive. The disorder is said to occur in about 20% of the general population and 3-5% of the school population. ADHD generally manifests before seven years of age.

Currently not much conclusive evidence exists regarding the exact cause or causes of ADHD. Several theories related to genetic, biological, social, psychological, physiological and environmental factors have been put forward. Based on recent research and our cumulative knowledge of the disorder, the most plausible of these is that of a polygenic inheritance. Symptomatic behaviors, however, are influenced to a great extent by environmental factors.

A number of approaches and methods of treatment for ADHD have been suggested over the years. These range from diet and treatment of allergies to medication, behavior modification, psychotherapy, counseling, and family therapy. Based on the research of Rachel Gittleman Klein and her colleagues (1980), Ayllon, Layman, and Kandel (1975), Ross and Ross (1982) and others, the best treatment approach appears to be a combination of Pharmacotherapy and Behavior Modification.

#### Suggested Targets for Further Research

Although the exact cause or causes of ADHD remain unknown, it is generally believed to be related to a polygenic inheritance, and experts in the field are of the opinion that, unlike many other illnesses, ADHD is not a manifestation of one's environment, though behaviors associated with the disorder may be effected to a marked degree by the nature of

one's environment. ADHD manifests itself early in childhood, and especially after the child begins school. Though it was first thought of purely as a childhood disorder, recent evidence suggests that at least one-third to one-half of all ADHD children continue to display behaviors symptomatic of the disorder into adolescence and adulthood. This leads me to think that the disorder may in some way be related to the structured environments in which our society's children are placed. Do we misleadingly put demands on children that they are unable to handle given their level of maturation and development?

Another interesting feature of ADHD is that it appears to be twice as prevalent in boys as in girls. Yet we believe that the disorder is not sex-linked. Is our notion that the disorder is not sex-linked mistaken, or is it our observation of its prevalence in boys? If it is a sex-linked disorder there should be no difference in prevalence rates between males and females. These differences lead me to wonder further about the structured nature of our school environments. Are our school environments structured in such a way that the demands they make on children are geared more toward meeting the needs of girls than boys, who lag almost two years behind girls in maturation? As most ADHD children are first identified in the school environment one wonders

whether our entire educational system is in some way related to the problem.

While research has shown that a combination of medication and behavior therapy is the most effective way of coping with ADHD, there is currently no data on the effects of long-term medication. Parents most often fear the effects of medication on their child's overall growth and physical development, susceptibility to drug addiction, and so on. Yet nothing has been done to determine the level of risk to which these children are exposed. Today over 600,000 children in North America alone are being treated with stimulant medication. Such a risk on the part of educators and physicians is not professional. It may even be regarded as taking the easy way out.

I was extremely concerned to find that ADHD is not recognized as a separate education category in the state of Virginia. Considering that it is the most prevalent childhood disorder, knowing the positive effects of early intervention, and the disorder's long history, one would imagine that educators would consider it a personal responsibility to push for legislature that would provide services for these children.

In order to enable these children to reach optimal school functioning, professionals both inside and outside the school environment need to work together with the child's parents to develop a comprehensive understanding of the disorder. It is important to remember that children with ADHD are multiproblem children in need of multimodal treatments. In almost every arena of life these children experience confrontation and failure. The majority of them have learning difficulties, serious behavior problems, social skill deficits, and problems regulating motivation and affect. They have difficulty controlling their own actions, are ostracized by peers, and are frequently in trouble with adults. As might be expected, over time such adverse experiences take their toll, resulting in low self-esteem, feelings of inadequacy, and lethargy.

#### Suggestions for Working and Interacting with ADHD Children

Once a child has been diagnosed ADHD both teachers and parents play an important role in helping the child overcome his or her difficulties in a manner that enables him or her to cope in society. Once the child's behaviors and academic achievements have been analyzed, decisions about classroom interventions may be made. Here are some of the best known and most effective classroom interventions according to Brownstein (1987), Renshaw (1974), Bloch (not dated), and the Virginia Department of Education Task Force Report (1988):

1. Seat the child in the least distracting part of the classroom, preferably near the teacher and away from windows, doors, the hallway, and other students.

2. Provide additional structure and routine which is maintained from day to day.

3. Be consistent in rules and discipline techniques. Make sure the child knows beforehand the consequences for certain behaviors exhibited either in the school or home environment.

4. Check the child's work often to make sure he is still on track.

5. Make frequent contact with the child by either touching or speaking directly to the child.

6. Be as creative as you can when instructing the child in some new concept. Use multiple modalities of instruction to maintain attention and increase learning.

7. Because many ADHD children have learning difficulties related to auditory processing, make sure to combine a visual-tactile approach when presenting instructions verbally.

8. Adapt materials and worksheets so that there are not too many instructions, pictures, and other distractions on the page.

9. Break down assignments into small chunks. Provide positive feedback for each section of the assignment completed.

10. Allow extra time to complete assignments when necessary.

11. If the child evidences problems related to staying in one place or on one task for too long, alternate desk work, group work, standing and moving activities, and different subjects for brief periods at a time. This helps keep the child on task longer.

12. Use plenty of exciting and challenging learning aids such as computers, typewriters, video cameras, and tape recorders.

13. Have a more attentive classmate's notes photocopied.

14. Use more multiple choice tests or one-on-one oral tests.

15. Encourage the child to develop a positive self-concept by providing a lot of praise for both academic and extra-curricular achievement and success--even if marginal.

16. Incorporate a social skills program to help the child learn to interact appropriately with peers, parents, and teachers.

17. Every time you assign a task to the child or are teaching him a new concept or skill, make sure that the child fully understands what he is required to do or what he is being taught.

18. Avoid showing anger, irritation, or rejection to the child. In other words, stay clam!



19. Be firm. Do not allow the child to get away without carrying out tasks of which you know he is capable. Do not allow him to use his disability as an excuse for poor work or inappropriate behavior.

20. Use simple commands and directions.

21. Never ask the child if he wants to do something. Always say, "do this!"

22. Redirect the child if he has swayed off the assigned task.

23. Lastly, respect the child as an individual in his or her own right.

I hope this manual has shown both parents and teachers the pressing need that exists for them to know more about ADHD, the most prevalent childhood disorder. I hope I have shown them not only the difficulties and complexities in coping with ADHD, but also the need to be more critical of the treatments proposed by authorities such as physicians, educators, psychologists, and counselors. Finally, I hope that I have shown why parents and teachers need to join forces and become advocates of legislature which will serve these children. They need to be given the opportunity to grow and develop to their maximum potential so that they may become productive and responsible members of society.

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